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# The Role of Medial Septal Gabaergic Neurons in Prefrontal Cortex Theta Modulation

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# THE ROLE OF MEDIAL SEPTAL GABAERGIC NEURONS IN PREFRONTAL CORTEX THETA MODULATION

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Theta activity recorded in various structures of the brain including the hippocampus, amygdala and prefrontal cortex (PFC) has been associated with attention, memory, decision-making and emotions. While several researchers have determined that hippocampal theta is gated by media septal area (MSA) neuronal firing, the same has not been equally demonstrated in the PFC. Previous research in this lab has shown MSA cholinergic neurons modulate PFC theta. However it is possible that other neurotransmitter systems, such as the MSA GABAergic system also help regulate PFC theta. Given that hippocampal theta is gated by both actelcholine and GABA, the GABAergic connections from the MSA to the PFC must be determined. Eight male Long Evans rats were used in the present experiments. A guide cannula was surgically placed in the MSA and a recording electrode was placed in the PFC. Several days later the rats were anesthetized with an injection of ketamine/xylazine and then infused with various doses of ethanol and the GABAergic agonist musicmol. The researchers predicted that both ethanol and musicmol in the MSA will reduce or eliminate theta activity in the PFC, similar to their effects on hippocampal theta.